

UNITED STATES PATENT AND TRADEMARK OFFICE

Re: Application of: Kari HOLOPAINEN, et al.
 Serial No.: Not yet known
 Filed: Simultaneously
 For: **METHOD FOR FITTING THE
 TUBULAR ROLL SHELL OF A ROLL IN
 A PAPER OR BOARD MACHINE WITH
 SLIDE BEARINGS, AND ROLL FOR
 APPLYING THE METHOD**

PRELIMINARY AMENDMENT

Assistant Commissioner of Patents
 Washington, D.C. 20231

May 31, 2001

Sir:

Prior to examination and calculation of the filing fee, please amend the above-identified application as follows:

IN THE SPECIFICATION:

Please substitute the "Un-Marked Version of the Substitute Specification" enclosed herewith for the original specification.

In addition, enclosed please find a "Marked-Up Version of the Substitute Specification" showing all of the amendments made to the original specification herein. Please note, additions to the specification are denoted by either underlining and/or hyphenating and deletions from the specification are denoted by bracketing.

0997455-03101
 101650-5572660

IN THE CLAIMS:

Please amend the claims as follows:

1. (Amended) A method for fitting a tubular roll shell (2) of a roll (1) in a paper or board machine with slide bearings, said method comprising supporting the roll shell (2) on a stationary roll shaft (3) by means of hydrostatic slide bearing elements (4a, 4b, 4a', 4b', 5a, 5b, 5a', 5b') acting on the roll shell (2) in radially opposite directions at least in the direction of a primary plane or a plane co-directional with a primary loading (F) and a plane substantially lateral to the plane co-directional with the primary loading (F), and said slide bearing elements (4a, 4b, 4a', 4b', 5a, 5b, 5a', 5b') being loaded hydraulically by means of a pressure fluid, [characterized in that the] wherein a hydrostatic pressure of [the] lateral bearing elements (4a, 4b; 4a', 4b') acting in radially opposite directions on the roll shell (2), in a direction substantially lateral to a plane co-directional with the primary loading (F), is adjusted by means of a regulator (20) having feedback connection from [the] main bearing elements (5a, 5b, 5a', 5b') acting in the direction of a plane co-directional with the primary loading (F) to comply at a predetermined ratio with [the] a maximum hydrostatic pressure of the main bearing elements (5a, 5b, 5a', 5b) acting on the roll shell (2).

2. (Amended) A method as set forth in claim 1, [characterized in that] wherein a one of said lateral bearing [element] elements (4b, 4b') is supplied with a constant pressure (P_s) and [the] an other of said lateral bearing [element] elements (4a, 4a') is supplied by way of the regulator (20) with a control pressure depending on the maximum pressure of the main bearing elements (5a, 5b, 5a', 5b).

3. (Amended) A method as set forth in claim 1 [or 2, characterized in that], wherein the lateral [bearings] bearing elements (4a, 4a') have a control pressure which is about 0,5 to about 1[, preferably about 0,5 to about 0,8] times the maximum pressure of the main bearing elements (5a, 5b, 5a', 5b').

4. (Amended) A method as set forth in [any of claims 1-3, characterized in that] claim 1, wherein the regulator (20) [used in the method] comprises a mechanical hydraulic valve.

5. (Amended) A method as set forth in claim 4, [characterized in that] wherein the mechanical hydraulic valve (20) comprises:

a cylindrical space (21) diametrically smaller at one end than at the other end;

a valve stem (22) [movable] axially movable lengthwise in the cylindrical space (21);

two slides (23, 24) fitted in the cylindrical space (21) in connection with the valve stem (22), [the] a first (23) of said slides being mounted on a first end of the valve stem (22) in a diametrically smaller cylindrical space (21a), and [the] a second (24) of said slides, which is provided with a spring (26), being mounted, in connection with the valve stem (22), in a diametrically larger cylindrical space (21b, 21c), whereby a pressure fluid is delivered to at least one lateral bearing element (4a, 4a', 4b, 4b'); and

a regulator element (25), which is fitted in connection with a second end of the valve stem (22) as well as in connection with a feed line (P) for a hydraulic pressure fluid, and that the first slide (23) is subjected to a hydrostatic control pressure consistent with a hydrostatic pressure acting on hydrostatic slide bearing elements (5a, 5a', 5b, 5b') which work against the spring (26) and act on a

roll shell (2) in a plane co-directional with a primary loading (F) for operating the valve stem (22) and the regulator element (25) in such a way that the hydraulic pressure fluid has access from the feed line (P) into the larger cylindrical space (21b, 21c) of the valve (20) in view of regulating a supply pressure delivered to at least one lateral bearing element (4a, 4a', 4b, 4b').

6. (Amended) A method as set forth in [any of claims 1-3, characterized in that] claim 1, wherein the regulator (20) comprises:

an electrically-controlled valve, [which receives its] said electrically-controlled valve receiving a control from [either] one of a pair of pressure detectors (52, 53) located along a transit path (8, 8', 9', 10) established between the electrically-controlled pressure detectors (52, 53) and the regulator (20), said electrically-controlled valve being mounted in connection with the main bearing elements (5a, 5a', 5b, 5b') acting on the roll shell (2) in the direction of a plane co-directional with the loading (F)[, along a transit path (8, 8', 9', 10) established between the pressure detectors (52, 53) and the regulator (20)].

7. (Amended) A method as set forth in [any of claims 1, 3, 4, 5 or 6, characterized in that] claim 1, wherein the regulator (20) is fitted in [the] a feed line (P) of one lateral bearing element (4a), said lateral bearing element (4a) being further provided with a control device (42), whereby [the] a hydraulic pressure is suppliable to another opposite lateral bearing element (4b), and whereby the shell [remaining] remains laterally immobilized relative to the roll shaft (3).

8. (Amended) A roll for [applying the method of claim 1 for] fitting a tubular roll shell (2) of a roll (1) in a paper or board machine, said roll shell (2) being supportable on a stationary roll shaft (3) by means of hydrostatic slide bearing elements (4a, 4b; 4a', 4b'; 5a, 5b; 5a', 5b') acting on the roll shell (2) in radially opposite directions at least in the direction of a first plane or a plane co-directional with a primary loading (F) and a plane substantially lateral to the plane co-directional with the primary loading (F), [and] said slide bearing elements (4a, 4b, 4a', 4b', 5a, 5b, 5a', 5b') being loadable hydraulically by means of a pressure fluid, comprising:

[characterized in that the] a regulator (20) for adjusting a hydrostatic pressure of [the] lateral bearing elements (4a, 4b; 4a', 4b') acting in radially opposite directions on the roll shell (2) in a direction substantially lateral to a plane co-directional with the primary loading (F) [is adjustable by means of a], said regulator (20) having feedback connection from [the] main bearing elements (5a, 5b, 5a', 5b') acting in the direction of a plane co-directional with the primary loading (F) to comply [at] with a predetermined ratio with [the] maximum hydrostatic pressure of the main bearing elements (5a, 5b, 5a', 5b') substantially acting on the roll shell (2).

9. (Amended) A roll as set forth in claim 8, [characterized in that] wherein a one of said lateral bearing [element] elements (4b, 4b') is suppliable with a constant pressure and [the] an other of said lateral bearing [element] elements (4a, 4a') is suppliable by way of a regulator (20) with a control pressure depending on the maximum pressure of the main bearing elements (5a, 5b, 5a', 5b').

10. (Amended) A roll as set forth in claim 8 [or 9, characterized in that] wherein the regulator (20) comprises a mechanical hydraulic valve.

11. (Amended) A roll as set forth in claim 10, [characterized in that the] wherein mechanical hydraulic valve (20) comprises:

a cylindrical space (21) diametrically smaller at one end than at the other end;

a valve stem (22) adapted to be [movable] axially movable lengthwise in the cylindrical space (21);

two slides (23, 24) fitted in the cylindrical space (21) in connection with the valve stem (22), [the] a first (23) of said slides being mounted on a first end of the valve stem (22) in a diametrically smaller cylindrical space (21a), and [the] a second (24) of said slides, which is provided with a spring (26), being mounted, in connection with the valve stem (22), in a diametrically larger cylindrical space (21b, 21c), whereby a pressure fluid is suppliable to at least one lateral bearing element (4a, 4a', 4b, 4b'); and

a regulator element (25), which is fitted in connection with a second end of the valve stem (22) as well as in connection with a feed line (P) for a hydraulic pressure fluid, and that the first slide (23) is subjectable to a hydrostatic control pressure consistent with a hydrostatic pressure acting on hydrostatic slide bearing elements (5a, 5a', 5b, 5b') which work against the spring (26) and act on a roll shell (2) in a plane co-directional with a primary loading (F) for operating the valve stem (22) and the regulator element (25) in such a way- that the hydraulic pressure fluid has access from the feed line (P) into the larger cylindrical space (21b, 21c) of the valve (20) in view of regulating a supply pressure delivered to at least one lateral bearing element (4a, 4a', 4b, 4b').

12. (Amended) A roll as set forth in claim 8, [characterized in that] wherein the regulator (20) comprises:

an electrically controlled valve, [whose control is obtainable] said electrically-controllable valve obtaining a control from [either] one of a pair of pressure detectors (52, 53) located along a transit path (8, 8', 9', 10) established between the pressure detectors (52, 53) and the regulator (20), said electrically-controlled valve being mounted in connection with the main bearing elements (5a, 5a', 5b, 5b') acting on the roll shell (2) in the direction of a plane co-directional with the loading (F)[, along a transit path (8, 8', 9', 10) established between the pressure detectors (52, 53) and the regulator (20)].

13. (Amended) A roll as set forth in [any of claims 8, 10, 11 or 12, characterized in that] claim 8, wherein the regulator (20) is connected with [the] a feed line (P) of one lateral bearing element (4a), said one lateral bearing element (4a) being further provided with a control device (42) for delivering [the] a hydraulic pressure to another opposite lateral bearing element (4b), wherein the shell [remaining] remains laterally immobilized relative to the roll shaft (3).

Please add the following new claims.

14. (New) A method as set forth in claim 1, wherein the lateral bearing elements (4a, 4a') have a control pressure which is about 0,5 to about 0,8 times the maximum pressure of the main bearing elements (5a, 5b, 5a', 5b').

15. (New) A method for fitting a tubular roll shell (2) of a roll (1) in a paper or board machine with slide bearings, said method comprising the steps of:

supporting the roll shell (2) on a stationary roll shaft (3) by means of hydrostatic slide bearing elements (4a, 4b, 4a', 4b', 5a, 5b, 5a', 5b') acting on the roll shell (2) in radially opposite directions at least in one of a direction of a primary plane or a plane co-directional with a primary loading (F) and a plane substantially lateral to the plane co-directional with the primary loading (F),

loading said slide bearing elements (4a, 4b, 4a', 4b', 5a, 5b, 5a', 5b') hydraulically by means of a pressure fluid, and

adjusting a hydrostatic pressure of a plurality of lateral bearing elements (4a, 4b, 4a', 4b') acting in radially opposite directions on the roll shell (2), in a direction substantially lateral to a plane co-directional with the primary loading (F), by means of a regulator (20), said regulator (20) having a feedback connection from a plurality of main bearing elements (5a, 5b, 5a', 5b') acting in the direction of a plane co-directional with the primary loading (F) in order to comply at a predetermined ratio with a maximum hydrostatic pressure of the main bearing elements (5a, 5b, 5a', 5b') acting on the roll shell (2).

Enclosed please find a "Marked-Up version of the Claims as Amended" including all of the amendments made to the claims above and including new claims 14 and 15 therein.

In addition, enclosed please find an "Un-Marked Version of the Claims as Amended" including all of the amendments made to the claims above. In addition, the "Un-Marked Version of the Claims as Amended" includes new claims 14 and 15 added herein.

New claim 15 is commensurate in scope with original claim 1 and is thus fully supported by the original specification. In addition, new claim 14, recites the narrower range limitation deleted from original claim 3.

Please note, additions to the claims are denoted by underlining and deletions from the claims are denoted by bracketing.

REMARKS

The specification has been amended to include section headings at appropriate locations and to correct minor grammatical errors.

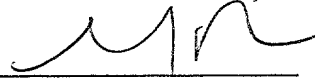
The claims have been amended to remove multiple dependencies therefrom in order to reduce the filing fee and to more clearly define the invention. New claims 14 and 15 have been added herein which are essentially commensurate in scope with original claims 3 and 1 and are supported by the original specification.

The amendments to the claims herein have been made to conform the claims to U.S. practice and have not been made for purposes of patentability.

An early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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Encls.

- Marked-Up Version of the Substitute Specification
- Un-Marked Version of the Substitute Specification
- Marked-Up Version of the Claims as Amended
- Un-Marked Version of the Claims as Amended

By // 
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2016-09-27 14:50:00